<center>**REMARKS**</center>

In view of the preceding amendments and the following remarks, the Applicant respectfully requests reconsideration of the present application.

The Claimed Invention

The invention solves an image detail problem in frames decoded from a conventional MPEG compressed video bitstream that reproduce a still image, particularly a still image containing text. Detail for decoded MPEG still images tends to be lower at the beginning of each group of pictures ("GOP") when an intra ("I") frame is decoded, increases during decoding of successive predicted ("P") frames and bidirectional ("B") frames in the GOP, only to decrease again upon decoding the next I frame. Thus, a decoding of the MPEG compressed video bitstream of a still image frequently produces a video image that appears to pulse visually, usually at a frequency that is identical to the frequency at which GOPs occur in the compressed video bitstream, e.g. twice per second. This visual pulsing of a decompressed MPEG compressed video bitstream of a still image in many instances makes them commercially unacceptable.

The present invention encodes a compressed video bitstream that includes compressed video data for a plurality of frames from data for a single still image. The first steps in the encoding method requires fetching the data for the still image, and then encoding the data for the still image into data for an I frame. The data for the encoded I frame is then stored, and the encoded

<center>-5-</center>

compressed video bitstream assembled by appropriately combining data for:

1. at least a single copy of the stored I frame;

2. at least one null frame; and

3. various headers required for decodability of the compressed video bitstream.

Decoding the compressed video bitstream prepared in this way produces frames of video which produce images that do not appear to pulse visually.

Objections and Rejections

The Examiner's Action dated December 6, 2000, Paper no. 2:

1. rejects claims 1-5 under 35 U.S.C. § 112, second paragraph; and

2. rejects claims 1-5 under 35 U.S.C. § 103(a) as being unpatentably obvious over:

    a. United States Patent no. 5,689,589 entitled "Data Compression for Palettized Video Images" which issued on an application filed December 1, 1994, by Michael J. Gormish and Martin P. Boliek ("the Gormish, et al. patent"):

    b. in view of:

        i. United States Patent no. 5,404,446 entitled "Dual Buffer Video Display System for the Display of Asynchronous Irregular Frame Rate Video Data" which issued April 4, 1995, on an

-6-

application filed by Ronald J. Bowater, Barry K. Aldred and Stephen P. Woodman ("the Bowater, et al. patent") and

ii. United States Patent no. 5,838,678 entitled "Method and Device for Preprocessing Streams of Encoded Data to Facilitate Decoding Streams Back-to Back" which issued on an application filed July 24, 1996, by Joseph W. Davis and Shawn M. Hayes ("the Davis, et al. patent").

Description of the Amendments

Claims 1-3 and 5 above have been amended in accordance with the suggestions set forth in the Examiner's Action except that the references respectively to the MPEG-1 and MPEG-2 recommendations in claims 2 and 3 have not been revised.

Regardless of whether or not the MPEG-1 and MPEG-2 recommendations may change at some future date, the Applicant respectfully suggests that the limitations expressed in claims 2 and 3 sufficiently defenite despite any such change in the MPEG-1 and MPEG-2 recommendations. The limitations present in claims 2 and 3 will remain there despite changes in either the MPEG-1 and MPEG-2 recommendations because the texts of those claims positively identify various headers and codes which must be present in data that encodes a still image before it could be alleged that an infringement either of claim 2 or of claim 3 is occurring.

-7-

The soundness of the preceding proposition that the limitations in claims 2 and 3 sufficiently definite is readily understood by considering method claims in general. No such claim could ever issue in a patent or ever be held valid and infringed by a court if the possibility that an accused infringing process might include an additional method step, or that an additional substance might be included in a composition allegedly processed in accordance with the claimed method, rendered the claim indefinite under 35 U.S.C. § 112, second paragraph. Any possible future change either in the MPEG-1 or in the MPEG-2 recommendations is completely analogous to the possibility that an accused infringing process might include an additional method step, or that an additional substance might be included in a composition processed in accordance with the claimed method. Since method claims, in general, do issue in patents and are held valid and infringed by courts, the possibility that an accused infringing process might include an additional method step, or that an additional substance might be included in a composition allegedly processed in accordance with the claimed method does not render such ordinary, conventional claims indefinite. Thus, the limitations expressed in claims 2 and 3 cause those claims to possess the same definiteness as method claims in general.

For the preceding reasons the Applicant respectfully submits that inclusion of reference to the MPEG-1 and MPEG-2 recommendations respectively in claims 2 and 3 does not render those claims indefinite, and that claims 2 and 3 as amended above traverse rejection under 35 U.S.C. § 112, second paragraph.

-8-

Dependent claims 6 and 7 added in this response are identical to amended claims 2 and 3 except they omit the phrase which respectively refers to the MPEG-1 and MPEG-2 recommendations.

The Cited References

The Gormish, et al. Patent

The Gormish, et al. patent discloses a compressor 108 for:

> data sources, such as a video cassette 102, a **still image 104**, a video sequence 105 and a workstation 106 which produces rendered images. Where the data source is image data, and especially sequences of image frames, compression is needed because of the large amount of memory needed for uncompressed images or sequences. **The present invention is described with reference to frame sequences,** however the present invention is useful with other types of data sharing similar characteristics of frame sequence data.
> The data is input to a compressor 108 which, if designed correctly, outputs a compressed image or images containing fewer bits than the original data. If compressor 108 is a lossless compressor, the original data is exactly recoverable from the bits of the compressed data. Once the data is compressed, it is applied to a channel, several examples of which are shown in FIG. 1. (Col. 4, lines 49-65) (Emphasis supplied.)

As explained in the abstract of the Gormish, et al. patent, the compressor 108:

> uses sameness information, such as temporal sameness of corresponding pixels, in the coding process. Two sets of contexts are used, one set when a pixel is the same as a sameness pixel, and one set of contexts for residual coding of the pixel when it is not the same. The use of the sameness bit saves computation because, if in decoding the one "sameness" bit, a decompressor determines that the pixel is equal to the corresponding pixel in a previous frame, then no further decoding is needed for that pixel.

Other than for the text identified above in the Examiner's Action, despite a diligent search of the Gormish, et al. patent,

-9-

Applicant is unable to find anywhere in that reference any further use of the word "still" or of the reference number 104. Also, Applicant is unable to find in the cited text any express discussion regarding an intra ("I") frame, i.e. a frame of compressed video data which can be decoded without reference to data in another frame of video data.

In describing FIG. 2 which illustrates the compressor 108 in greater detail than FIG. 1, the Gormish, et al. patent expressly states that:

> **an original file 200 [represents] a sequence of uncompressed images (frames)** and a compressed file 220 [represents] a compressed version of original file 200.
>
>   *   *   *
>
>   Compressor 108 moves the original data through a context modeller 202C, and an entropy coder 208C to form compressed file 220. **Context modeller 202C has an input for accepting original pixels and a pixel clock.** (Col. 5, line 58 – col. 6, line 2) (Emphasis supplied.)
>
>   **In operation, during each cycle of the pixel clock, compressor 108 accepts an input pixel (the "current" pixel) from file 200, which contains the original pixels. In response to the current pixel, compressor 108 outputs a number of bits to compressed file 220, where the number depends on the state of compressor 108, and can be zero bits (i.e. no bits output in a given input pixel cycle).** In the zero bit output case, the internal state of 108 is changed. This will be reflected in a later compressed bit or bits. (Col. 6, lines 43-51) (Emphasis supplied.)

Despite a diligent search of the Gormish, et al. patent, Applicant is unable to find therein any disclosure or suggestion of:

1.   "encoding data for a still image into data for an intra ("I") frame" as expressly required by independent claim 1; or

-10-

2.   a null frame; or

3.   combining data for the I frame with that for a null

frame.

Correspondingly, despite a diligent search of the Gormish, et al.

patent, Applicant is unable to find therein any disclosure or

suggestion that decoded still images that have been encoded in

accordance with the reference's disclosure do not pulse visually.

The Bowater, et al. Patent

The Bowater, et al. patent addresses the technological problem

that:

> [i]n computer-based video communication systems, a video
> signal is obtained from the camera at a constant frame
> rate but, **after transmission across the asynchronous or**
> **non-ideal network, the frames arrive at irregular**
> **intervals. Some frames arrive early, some are delayed,**
> **and bunching can occur.** The display device at the
> receiving terminal, however, generally requires a
> constant frame rate supplied to it (e.g., to match the
> raster scan rate of a CRT). In such systems it is
> therefore necessary to match the irregular arrival of
> frames over the network with the constant supply required
> to the output screen.
>   *   *   *
> The designer of computer based video communication
> systems is . . . faced with the problem of how to
> achieve regular play-out of the asynchronous incoming
> video signal while, at the same time, minimising the
> number of buffered video frames. (Col. 1, lines 38-64)
> (Emphasis supplied.)

To solve the preceding technological problem the Bowater, et

al. patent discloses a workstation 13 that:

> includes first buffer means for storing incoming frames
> received from the network, second buffer means for
> supplying frames to the screen at said regular rate, and
> control process means for transferring the frames from
> the first buffer to the second buffer. The control

-11-

process can decide whether to transfer frames from the
first to second buffer and, if so, when and how many
frames to transfer, or whether to delete frames instead.
(Col. 2, lines 2-10)

The Bowater, et al. patent further discloses that:

**It is also advantageous, on occasions when the first
buffer is empty and the second buffer needs more frames,
for the control process to create null frames for
transfer to the second buffer.** This, again, reduces the
risk of buffer starvation of the second buffer. Since
any nulls so inserted add to the effective buffering, it
is also useful to be able to delete delayed frames when
they do finally arrive, so as to allow the displayed
image to catch up with the received one. (Col. 2, lines
48-56)

**A null frame is essentially the same as the preceding
frame, so that, as far as the viewer is concerned, [the
normally changing] video image temporarily freezes.**
(Col. 4, lines 23-27)   (Emphasis supplied.)

Based upon the preceding texts excerpted from the Bowater, et

al. patent, that reference discloses:

1.   an apparatus and procedure for buffering motion video

     data in a decoding device prior to displaying an image

     on a screen that accommodates irregular arrival of

     frames of video data due to their transmission across

     an asynchronous or non-ideal network; and

2.   accommodating insufficient data arriving at the decod-

     ing device via the asynchronous or non-ideal network

     by:

     a.   temporarily freezing the image appearing on the

          screen; and

     b.   subsequently deleting delayed frames of data when

          they do arrive.

-12-

Despite diligently searching the Bowater, et al. patent, Applicant is unable to find there any disclosure or suggestion that the disclosed buffering technique prevents still images from pulsing visually.

The Davis, et al. Patent

The Davis, et al. patent depicts in FIG. 7:

a high level block schematic showing a system for encoding, communicating, and decoding video and audio data in accordance with the MPEG II standard.

*   *   *

[A] transport stream multiplexer 712 [depicted in FIG. 7] multiplexes . . . encoded audio and video packets to form a [MPEG II] transport stream 100 and provides the transport stream 100 to communications link 722. At a remote end of the communications link 722, a transport stream demultiplexer 724 receives the multiplexed transport stream 100.

*   *   *

[T]ransport streams 100[, illustrated in FIG. 1,] permit one or more programs with one or more independent time bases to be combined into a single stream. That is, a transport stream 100 may include a first program and a second program. **In presently contemplated systems, both the video decoder 730 and the audio decoder 734 must be reset before decoding a next program, ... Thus, for example, in such systems there must be a temporal gap (e.g., one second) between the decoding of the first and second programs to permit the video and audio decoders 730 and 734, respectively, to be reset. This temporal gap precludes the playing of the second program directly following the first program.** Moreover, it is difficult to determine when one program ends and another begins in real-time. Thus, a method and/or a device is needed to permit more than one program to be played (i.e., decoded) back-to-back. The method and/or device should also overcome, or avoid, the difficulties of determining program boundaries in real-time.

*   *   *

[T]he video decoder 730[, depicted in FIG. 7,] often needs past and future frames to decode a picture (B-Picture) frame. If the last temporal (displayed) frame of a first program is used in decoding a first temporal (displayed) frame of a second program, or if a

-13-

partial video frame is used, the output of the video decoder 730 will have been improperly decoded, disadvantageously causing video artifacts. Thus, . . . the decoders must be reset between programs in known systems. (Col. 4, line 17 - col. 5, line 13) (Emphasis supplied.)

To solve the preceding technological problem the Davis, et al. patent specifically discloses:

a method for preprocessing multiplexed streams of packets of packetized, encoded, audio and video sequences such that an audio decoder can decode the encoded audio sequence to produce an audio sequence and a video decoder can, without being reset, decode the encoded video sequence to produce a video sequence. **The method of the present invention (i) verifies that the multiplexed stream complies with an encoding standard, (ii) preprocesses packets of the packetized, encoded, video sequence such that no video artifacts are produced when the video decoder decodes an adjacent encoded video sequence, and (iii) preprocesses the packets of the packetized, encoded, audio data sequence such that its start time is within a first predetermined time of the start time of the video sequence and its temporal length is within a second predetermined time of the temporal length of the video sequence.**
The step of preprocessing the packets of the packetized, encoded, video sequence preferably includes (i) deleting any video frames that cannot be decoded if video frames of the video sequence are not temporally correct, and (ii) deleting any video frames following a code indicating an end of the encoded video sequence. The step of preprocessing the packets of the packetized, encoded, audio sequence preferably includes (i) removing any partial audio frames, (ii) adjusting (i.e., adding or deleting) the number of audio frames, if necessary, such that the audio and video sequences start within the first predetermined time, and (iii) adjusting (i.e., adding or deleting) the number of audio frames, if necessary, such that the temporal lengths of the audio and video sequences are within the second predetermined time. (Col. 5, line 63 - col. 6, line 27) (Emphasis supplied.)

Despite a diligent search of the Davis, et al. patent, Applicant is unable to find any mention there that the disclosed preprocessing method may be used advantageously in encoding still images in accordance with the MPEG I or MPEG II standards, or of

-14-

the use of null frames in such encodings. Similarly, despite a diligent search Applicant is unable to find in the Davis, et al. patent any disclosure or suggestion that the disclosed preprocessing technique prevents still images from pulsing visually.

Legal Principles Applicable to
Rejections Under 35 U.S.C. 103(a)

Certain well established principles are to be applied in assessing whether or not an invention is patentable under 35 U.S.C. 103(a). First, the claims of a patent, which define the invention, are "to be construed in light of the specification and both are to be read with a view to ascertaining the invention." United States v. Adams, 383 U.S. 39, 49, 148 USPQ 479, 482 (1966). The "differences between the prior art and the claims at issue are to be ascertained." Graham v. John Deere Co., 383 U.S. 1, 17, 148 USPQ 459, 467 (1966). Moreover, it is elementary that the claimed invention must be considered as a whole in deciding obviousness. Litton Industrial Products, Inc. v. Solid State Systems Corp., 755 F.2d 158, 164, 225 USPQ 34, 38 (Fed. Cir. 1985). The prior art as a whole must be considered, and those portions of the prior art arguing against or teaching away from the claimed invention must be considered. Bausch & Lomb, Inc v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 448, 230 USPQ 416, 420 (Fed. Cir. 1986), In re Hedges, et al., 783 F.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986).

Docket no. 2134   April 4, 2001

An invention is obvious under 35 U.S.C. § 103(a), only if the prior art suggests a modification of the reference(s) and/or their combination. In *In re Gordon*, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984) the Court of Appeals for the Federal Circuit ("CAFC") reversed a Board of Appeals decision that a patent application's claims were obvious under 35 U.S.C. § 103 holding "that although a prior art [fuel filter] device could have been turned upside down, that did not make the modification obvious unless the prior art fairly suggested the desirability of turning the device upside down." *Continental Can Co. USA, Inc. v. Monsanto Co.* 948 F.2d 1264, ___, 20 USPQ2d 1746, 1751 (Fed. Cir. 1991). "The mere fact that the prior art could be . . . modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon*, supra at 221, 1127. In accord, *In re Laskowski*, 871 F.2d 115, 117, 10 USPQ2d 1397, 1398 (Fed. Cir. 1989). "[E]lements of separate prior patents cannot be combined when there is no suggestion of such combination anywhere in those patents". *Panduit Corp. v. Dennison Manufacturing Co.*, 810 F.2d 1561, 1568, 1 USPQ2d 1593, 1597 (Fed. Cir. 1987) citing *ACS Hospital Systems, Inv. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). (Emphasis supplied.) An examiner is obliged to explain why combining references is proper indicating why one skilled in the art would make a combination or substitution. *Ex parte Skinner*, 2 USPQ2d 1788, 1790 (Bd. Pat. App. & Int. 1986).

-16-

"When relying on numerous references . . . , . . . the examiner . . . [must] identify some suggestion to combine references or make the modification." In re Mayne, 104 F.3d 1339, ____, 41 USPQ2d 1451, _____ (Fed. Cir. 1997) citing In re Jones 958 F.2d 347, ____, 21 USPQ2d 1941, _____ (Fed. Cir. 1992). (Emphasis supplied.) "In reviewing the Board's obviousness conclusions, we have been guided by the well-settled principles that the claimed invention must be considered as a whole, multiple cited prior art references must suggest the desirability of being combined, and the references must be viewed without the benefit of hindsight afforded by the disclosure." In re Paulsen, 30 F.3d 1475, _____, 31 USPQ2d 1671, _____ (Fed. Cir. 1994). "[T]he absence of such a suggestion to combine is dispositive in an obvious determination." Gambro Lundia AB v. Baxter Healthcare Corp., 110 F.3d 1573, 1578-79, 42 USPQ2d 1378, 1383, 1384 (Fed. Cir. 1997) (Emphasis supplied)

Finally, it is impermissible to first ascertain factually what the inventor did and then view the prior art in such a manner as to select from the random facts of that art only those which may be modified and then utilized to reconstruct the invention from such prior art. Panduit Corp. v. Dennison Manufacturing Co., 774 F.2d 1082, 1092, 227 USPQ 337, 343 (Fed. Cir. 1985).

A critical step in analyzing the patentability of claims pursuant to section 103(a) is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See Dembiczak, 175 F.3d at 999, 50 USPQ2d at 1617. Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall

victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." Id. (quoting W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983)). In Re Werner Kotzab, 217 F.3d _____, 1369, 55 USPQ2d _____, 1316 (Fed. Cir. 2000).

Applying the preceding principles to the claims of the present application and to the various references discussed herein, the Applicant respectfully submits that a proper reading of the references, either alone or in combination, fails to disclose or to even suggest the invention embodied in the presently pending claims.

Argument

In rejecting claims 1-5, that encompass solutions for visual pulsing during display of decoded MPEG still images, for obviousness under 35 U.S.C. § 103(a) the Examiner's Action combines:

1. a reference that discloses a pixel-based method for adaptively encoding a sequence of video frames ("the Gormish, et al. patent"); with

2. a reference that discloses an apparatus and method for buffering motion video data in a decoder ("the Bowater, et al patent); and

3. a reference that discloses a method for preprocessing packets of packetized, encoded, audio and video sequences that eliminates video artifacts and avoids having to reset a decoder when sequentially decoding a sequence of two different programs ("the Davis, et al. patent").

-18-

As Applicant observes above, none of these three references even alludes to the problem that data decoded from conventionally MPEG encoded still images produces images which pulse visually. Furthermore, none of these three references either explicitly or implicitly suggest that they be combined for solving any problem, no less solving the problem that data decoded from conventionally MPEG encoded still images produces images which pulse visually. Under the controlling authority of In re Gordon supra, Panduit Corp. v. Dennison Manufacturing Co. supra, In re Mayne, supra, In re Paulsen, supra and Gambro Lundia AB v. Baxter Healthcare Corp., supra, the lack of such a suggestion in the references is dispositive, and prohibits combining the references to reject pending claims 1-5 for obviousness under 35 U.S.C. § 103(a).
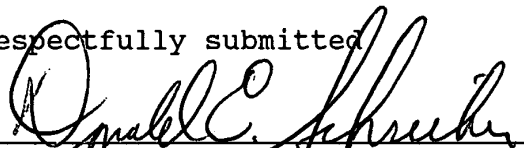
The Examiner's Action eclectic use of these three (3) widely disparate references in rejecting claims 1-5 for obviousness under 35 U.S.C. § 103(a) raises a question of what might possibly motivate one of ordinary skill in the art to select individual elements respectively from three (3) references, which respectively relate to encoding, decoding and preprocessing to obtain a method for encoding still images. Since only the pending application describes the problem that data decoded from conventionally MPEG encoded still images produces images which pulse visually, that means that the present application is the only possible source of any motivation to combine the three references. It is **impermissible** to first ascertain factually what the inventor did and then view the prior art in such a manner as to select from the random

-19-

facts of that art only those which may be modified and then utilized to reconstruct the invention from such prior art. <u>Panduit</u> <u>Corp. v. Dennison Manufacturing Co.</u>, supra.

Conclusion

For the reasons set forth above, the Applicant respectfully submits that claims 1-5, as amended above, traverse rejection under 35 U.S.C. § 112. Furthermore, for the reasons set forth above the Applicant respectfully submits that rejection of claims 1-5 for obviousness under 35 U.S.C. § 103(a) in the Examiner's Action contravenes controlling authority. Accordingly, the Applicant respectfully requests that their rejection of claims 1-5 be with-drawn, and that claims 1-7 now pending in this patent application pass immediately to issue.

Respectfully submitted

_____
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-20-

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Mark D. Conover   Docket no. 2134

Serial no : 09/168,644

Filed   : October 8, 1998

For   : ENCODING A STILL IMAGE
            INTO COMPRESSED VIDEO

Art Unit : 2613   Examiner: Richard Lee

Commissioner of Patents
Washington, D.C. 20231

CLAIMS AMENDED BY REWRITING
MARKED-UP TO SHOW ALL THE CHANGES
RELATIVE TO THE PREVIOUS VERSION OF THE CLAIMS

1.   (Amended) A method for producing a compressed video bitstream that includes compressed video data for a plurality of frames from data that specifies a single still image, the method comprising the steps of:

5   fetching the data for the still image;

           encoding the data for the still image into data for an intra ("I") frame;

           storing the encoded I frame data;

           assembling the compressed video bitstream by appropriately
10   combining data for:

                   at least a single copy of the stored I frame;

                   at least one null frame; and

                   various [a] headers required for decodability of the compressed video bitstream;

15   whereby decoding of the compressed video bitstream produces frames

of video which produce images that do not appear to pulse visually.

2.   (Amended) The method of claim 1 wherein:

the assembled compressed video bitstream [may be decoded] is

decodable in accordance with the MPEG-1 standard; and

the various headers assembled into the compressed video

5 bitstream include:

a sequence_header beginning the compressed video

bitstream;

at a beginning of group of pictures, a group_start_code;

for each encoded frame, a picture_start_code; and

10   a sequence_end_code ending the compressed video

bitstream.

3.   (Amended) The method of claim 1 wherein:

the assembled compressed video bitstream [may be decoded] is

decodable in accordance with the MPEG-2 standard; and

the various headers assembled into the compressed video

5 bitstream include:

a sequence_header beginning the compressed video

bitstream;

for each encoded frame:

a picture_header; and

10   a picture_coding_extension; and

-2-

a sequence_end_code ending the compressed video bitstream.

5.   (Amended) The method of claim 1 wherein null frames assembled into the compressed video bitstream also include bitstream stuffing whereby the compressed video bitstream [may be transmitted] is transmittable at a pre-established bitrate.